

NASA Facts

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**Statement of NASA Administrator Sean O'Keefe
before the Committee on Commerce, Science, and Transportation
United States Senate**

Mr. Chairman and Members of the Committee, thank you for this opportunity to appear today to discuss the President's vision for U.S. Space Exploration and NASA's plans for implementing this vision. On January 14th, the President visited NASA Headquarters and announced his vision for U.S. Space Exploration. In his address, the President presented a vision that is bold and forward-thinking yet practical and responsible – one that explores answers to longstanding questions of importance to science and society, and will develop revolutionary technologies and capabilities for the future, while maintaining good stewardship of taxpayer dollars.

The vision forms the basis of the new U.S. space exploration policy, "A Renewed Spirit of Discovery," a copy of which is appended to this testimony. This policy is the product of months of extensive and careful deliberations. The importance of these deliberations increased with the findings of the *Columbia* Accident Investigation Board, which emphasized the importance of setting clear, long-term goals for the Nation's human space flight program. Inputs from Members of this Committee and other Members of Congress informed the Administration's deliberations. Many others contributed their ideas for the future of the space program. These deliberations also formed the basis for formulating the President's FY 2005 Budget request for NASA, which will be released on February 2nd. A commission will advise on specific issues for implementation of the policy's goals within four months of its first meeting.

Today, I will walk you through the goals set forth in the policy, the major steps to implementing the new policy, the implications of this directive for NASA's programs and resources, and what the Nation's future in exploration and discovery will look like in the coming years.

Vision Goals

The fundamental goal of the new U.S. space exploration policy is to advance U.S. scientific, security, and economic interests through a robust space exploration program. In support of this goal, NASA will:

- Implement a sustained and affordable human and robotic program to explore the solar system and beyond;
- Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;
- Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and
- Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.

Implementation

To achieve these goals, NASA will plan and implement an integrated, long-term robotic and human exploration program structured with measurable milestones and executed on the basis of available resources, accumulated experience, and technology readiness. The policy envisions the following major implementation elements:

Space Shuttle – NASA will return the Space Shuttle to flight as soon as practical, according to the recommendations of the Columbia Accident Investigation Board. The focus of the Space Shuttle will be finishing assembly of the International Space Station (ISS). With its job done, the Space Shuttle will be retired when assembly of the ISS is complete, planned for the end of the decade.

International Space Station – NASA plans to complete assembly of the ISS, including those U.S. components that support U.S. space exploration goals and those planned by foreign partners, by the end of the decade. U.S. research activities aboard the ISS will be focused to support the new exploration goals, with the emphasis on understanding how the space environment affects astronaut health and capabilities and developing countermeasures.

New Space Transportation Capabilities – NASA will initiate Project Constellation to develop a new Crew Exploration Vehicle (CEV) to provide crew transport for exploration missions beyond low Earth orbit. NASA plans to develop the CEV in a step-by-step approach, with an initial unpiloted test flight as early as 2008,

followed by tests of progressively more capable designs that provide an operational human-rated capability no later than 2014.

As we begin the process of retiring the Space Shuttle from service, NASA will separate to the maximum practical extent crew and cargo transportation for both ISS and exploration missions. NASA will acquire ISS crew transport as required and cargo transportation as soon as practical and affordable. NASA envisions that commercial and/or foreign capabilities will provide these services. The CEV may supplement these ISS capabilities, but its design will be driven by exploration requirements.

Lunar Exploration – NASA will undertake lunar exploration and demonstration activities to enable sustained human and robotic exploration of Mars and other destinations in the solar system. Starting no later than 2008, NASA plans to launch the first in a series of robotic missions to the Moon to prepare for and support human exploration activities. The policy envisions the first human expedition to the lunar surface as early as 2015 but no later than 2020. These robotic and human missions will further science and demonstrate new approaches, technologies, and systems, including the use of space resources, to support sustained human exploration to Mars and other destinations.

Exploration of Mars – NASA will enhance the ongoing search for water and evidence of life on Mars by pursuing technologies this decade for advanced science missions to Mars in the next decade. Also starting next decade, NASA will launch the first in a dedicated series of robotic missions to Mars to demonstrate capabilities that will greatly enhance robotic capabilities and enable future human exploration of Mars. NASA will conduct human expeditions to Mars and other destinations beyond Earth orbit on the basis of available resources, accumulated experience, and technology readiness.

And Destinations Beyond – Over the next two decades, NASA will conduct an increasingly capable campaign of robotic exploration across the solar system. The stunning images we have received from Mars are just the beginning. NASA will launch advanced space telescope searches for Earth-like planets and habitable environments around other stars. NASA will explore Jupiter's moons, the asteroids, and other solar system bodies to search for evidence of life, understand the history of the solar system, and search for resources.

To advise on issues for achieving these goals, the President will form a commission of private and public sector experts. Former Undersecretary of Defense and Secretary of the Air Force, Pete Aldridge, will be the Chair of the Commission. This commission will issue its report within four months of its first meeting.

NASA Program Changes

To successfully execute the exploration vision, NASA will focus its organization, create new offices, align ongoing programs, experiment with new ways of doing business, and tap the great innovative and creative talents of our Nation.

Immediately following the President's speech, I announced the creation of the Exploration Systems Enterprise, which will have responsibility for developing the Crew Exploration Vehicle and other exploration systems and technologies. Retired U.S. Navy Rear Admiral Craig Steidle, former manager of the Defense Department's Joint Strike Fighter Program, is heading this new organization. Relevant programs of the Aerospace Technology, Space Science, and Space Flight enterprises are being transferred to the Exploration Systems Enterprise. The Aerospace Technology Enterprise has been renamed the Aeronautics Enterprise to reflect its new focus.

As human explorers prepare to join their robotic counterparts, coordination and integration will increase. The Exploration Systems Enterprise will work closely with the Space Science Enterprise to use the Moon to demonstrate new approaches, technologies, and systems to support sustained human exploration. NASA's Space Science Enterprise will have responsibility for implementing robotic testbeds on the Moon and Mars and will also demonstrate other key exploration technologies – such as advanced power, propulsion, and communications – in missions to Mars and Jupiter's moons. NASA's Space Science Enterprise will eventually integrate human capabilities into the exploration of Mars and other destinations.

Many other elements of the NASA organization will be focused to support this new direction. NASA's Biological and Physical Research Enterprise will put much greater emphasis on bioastronautics research to enable human exploration of other worlds. NASA's Office of the Space Architect will be responsible for integrating the exploration activities of NASA's different Enterprises and for maintaining exploration roadmaps and coordinating high-level requirements.

As we move outward into the solar system, NASA will look for innovative ideas from the private sector and academia to support activities in Earth orbit and future exploration activities. Many of the technical challenges that NASA will face in the coming years will require innovative solutions. In addition to tapping creative thinking within the NASA organization, NASA will leverage the ideas and expertise resident in the Nation's universities and industry.

In his speech, the President directed NASA to invite other nations to share in the challenges and opportunities of this new era of exploration and discovery. Building on NASA's long history and extensive and close ties with the space and research agencies of other nations, we will actively seek international partners in executing future exploration activities.

NASA will also invigorate its workforce, focus its facilities, and revitalize its field centers. As exploration activities get underway, NASA anticipates planning, reviews, and changes to align and improve its infrastructure. In order to achieve the exploration vision, we will be making decisions on how to best implement new programs. While some of these necessary actions will not be easy, they are essential to the overall effort before us. I urge you to consider the full context of what we will be proposing rather than any isolated, specific action. Such a perspective will allow us to move forward in implementing the vision.

Budget Resources

The exploration vision for solar system exploration is affordable in both the short-term and the long-term. The President's FY 2005 Budget request for NASA, to be released on February 2nd, will be fiscally responsible and consistent with the Administration's goal of cutting the budget deficit in half within the next five years. NASA's FY 2005 Budget will increase by \$1 billion over five years when compared with the President's 2004 plan, an increase of around five percent per year over the next three years and approximately one percent for the following two years. Although the budget increases are modest, NASA will be able to carry out a robust exploration program. In addition to the new funding, the vision will be supported by \$11 billion in reprogrammed funds over the next five years, the majority of which will come from human space flight related programs. In the next decade, retiring the Space Shuttle will free up over \$4 billion per year, enabling full-scale development and operation of human missions to the Moon.

The budget strategy supporting the vision will not require large balloon payments by future Congresses and Administrations. Unlike prior major civil space initiatives, the approach is intentionally flexible, with investments in sustainable exploration approaches to maintain affordability.

The Nation's Future in Exploration and Discovery

As we embark on this new chapter of exploration, we are mindful of the risk attendant on that quest. And as we gather today, on this the 18th anniversary of the *Challenger* tragedy, it serves as a stark reminder of the price we pay for human exploration. It has been the case through human history. This painful reminder serves as a clarion call to redouble our efforts to undertake this new chapter in exploration in the safest manner humanly possible. As a testament to the courage of the *Challenger* crew, and their contribution to human exploration, we will designate the landing site of the *Opportunity* rover on Mars as the *Challenger* Memorial Station.

As the President stated in his speech, we are embarking on a journey, not a race. We begin this journey knowing that many years of hard work and sustained effort will be required, yet we can look forward to achieving concrete

results in the near term. The vision makes the needed decisions to secure long-term US space leadership. It provides an exciting set of major milestones with human and robotic missions. It pursues compelling science and cutting edge technologies. It invites new ideas and innovations for accomplishing the vision. And it will provide the opportunity for new generations of Americans to explore, innovate, discover and enrich our Nation in ways unimaginable today. The President's challenging vision provides unique opportunities for engaging students across the country, "as only NASA can," to enter careers in science, engineering, technology and math. I sincerely appreciate the forum that the Committee provided today, and I look forward to responding to your questions.

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